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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/802,168	03/08/2001	Takashi Saida	44471-254519 (13700)	6188
7590 02/13/2004			EXAMINER	
ROGER T. FROST KILPATRICK STOCKTON LLP 2400 Monarch Tower 3424 Peachtree Road, N.E. Atlanta, GA 30326			KAO, CHIH CHENG G	
			ART UNIT	PAPER NUMBER
			2882	

DATE MAILED: 02/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/802,168

Applicant(s)

SAIDA ET AL.

Examiner

Chih-Cheng Glen Kao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1 and 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. (US Patent 5010346) in view of Paiam (US Patent 6421478), Okugawa et al. (JP 11-055320), and Tachikawa et al. (US Patent 5414548).

2. Regarding claim 1, Hamilton et al. discloses an optical signal processing device (Fig. 1) comprising an input optical waveguide (Fig. 1, #18), an optical splitter after the input (Fig. 1, #20), an optical delay waveguide array after the splitter (Fig. 1, #32), an optical combiner (col. 6, lines 9-14), and output optical waveguides (Fig. 1, #46, 48, 50, 52, and 54).

However, Hamilton et al. does not disclose a combiner after a delay array, an output waveguide into a port, optical gates off the substrate, amplitude adjustment of the array to a different intensity, or silica-based waveguides.

Paiam teaches the combiner (Fig. 2a, #12) and an output waveguide into a port (Fig. 2a, #4). Okugawa et al. teaches optical gates off a substrate (Fig. 1, #5 and 6). Tachikawa et al. teaches amplitude adjustment of the array (Fig. 8, #95) to a different intensity (inherent) and silica-based waveguides (col. 8, lines 39-45).

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It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the device of Hamilton et al. with the combiner and port of Paiam, since one would be motivated to use it for routing and directing optical signals as implied from Paiam (col. 4, lines 56-60).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the device of Hamilton et al. with the optical gates of Okugawa et al., since one would be motivated to have it for controlling the optical signals and letting only certain signals through as implied from Okugawa et al. (Abstract, Solution).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the device of Hamilton et al. with the amplitude adjustment of Tachikawa et al., since one would be motivated to amplify for compensation of loss in signal intensity as implied from Tachikawa et al. (col. 11, lines 1-2).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the device of Hamilton et al. with silica based waveguides of Tachikawa et al., since one would be motivated to incorporate it for savings on manufacturing costs as implied from Tachikawa et al. (col. 8. lines 39-45).

3. Regarding claims 3 and 4, Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. suggests a device as recited above.

However, Hamilton et al. does not disclose the waveguides, splitter, array, combiner, and gate on a substrate and a gate between the combiner and output off the substrate.

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Tachikawa et al. further teaches waveguides, array, and combiner on a substrate (Fig. 5).

Okugawa et al. teaches optical gates off a substrate (Fig. 1, #5 and 6).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., with the waveguides, array, and combiner along with the splitter and gate on the substrate, since rearranging parts of an invention only involves routine skill in the art. One would be motivated to have all the parts on the substrate to keep the components together to conserve space and provide support to the components.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. with optical gates off the substrate, since one would be motivated to have it for controlling the optical signals and letting only certain signals through as implied from Okugawa et al. (Abstract, Solution). Secondly, it would have been obvious, to one having ordinary skill in the art, to have the gate off the substrate, since rearranging parts of an invention involves routine skill in the art.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have to have the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. with the gate between the combiner and output, since rearranging parts of an invention only involves routine skill in the art. One would be motivated to have this arrangement to conserve on costs and have one optical gate instead of many as seen in Okugawa et al. (Fig. 1, #6).

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4. Regarding claim 5, Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. suggests a device as recited above.

However, Hamilton et al. does not disclose optical gate elements.

Okugawa et al. further teaches optical gate elements (Fig. 1, #5 and 6).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. with optical gate elements, since one would be motivated to have it for controlling the optical signals and letting only certain signals through as implied from Okugawa et al. (Abstract, Solution).

5. Regarding claim 6, Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. suggests a device as recited above.

However, Hamilton et al. does not disclose phase controllers on the waveguides after gate elements.

Paiam teaches phase controllers on the waveguides.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. with phase controllers, since one would be motivated to use it for tuning the array into different functions as implied from Paiam (col. 11, lines 13-22).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. with the phase controllers after gate elements, since rearranging parts

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of an invention only involves routine skill in the art. One would be motivated to have the phase controllers after gate elements to create even more path length changes after the delay array as implied from Paiam (col. 12, lines 22-41).

6. Regarding claim 7, Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. suggests a device as recited above.

However, Hamilton et al. does not disclose amplitude adjustment of the array to a different intensity.

Tachikawa et al. teaches amplitude adjustment of the array (Fig. 8, #95) to a different intensity (inherent).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the device of Hamilton et al. in view of Paiam, Okugawa et al.; and Tachikawa et al. with the amplitude adjustment; since one would be motivated to amplify for compensation of loss in signal intensity as implied from Tachikawa et al. (col. 11, lines 1-2).

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. as applied to claim 1 above, and further in view of Duguay et al. (US Patent 3838278).

Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. suggests a device as recited above.

However, Hamilton et al. does not disclose a digital-to-analog converted value of the optical signals.

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Duguay et al. teaches a digital-to-analog converted value of the optical signals (col. 3, lines 23-25).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. with the digital-to-analog converted value of the optical signals of Duguay et al., since one would be motivated to have these conversions to make this compatible with either existing electronic transmission systems or with future optical transmission systems (col.1, lines 40-44) as implied from Duguay et al.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. as applied to claim 1 above, and further in view of Ishida et al. (US Patent 5937117) and Inoue et al. (US Patent 5546483).

Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. suggests a device as recited above.

However, Hamilton et al. does not disclose a Mach-Zehnder switch with a thin film heater as the amplitude controller or a thin film heater as an optical modulator.

Ishida et al. teaches a Mach-Zehnder switch with a thin film heater as the amplitude controller (col. 8, lines 66-67, and col. 9, lines 1-5). Inoue et al. teaches a thin film heater as an optical modulator (col. 14, lines 60-65).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. with the Mach-Zehnder switch of Ishida et al., since one would be

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motivated to use it as a selector to determine which signals get through as implied from Ishida et al. (col. 8, lines 57-67).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. with the thin film heater of Inoue et al., since one would be motivated to use it to adjust light to satisfy a certain relative phase condition as implied from Inoue et al. (col. 15, lines 12-15).

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. as applied to claim 1 above, and further in view of Kito et al. (JP 09-258045).

Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. suggests a device as recited above.

However, Hamilton et al. does not disclose a multi-mode interference optical coupler.

Kito et al. teaches a multi-mode interference optical coupler (Abstract, Solution).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. with the coupler of Kito et al., since one would be motivated to use it for super-high speed optical transmissions in optical communication systems as implied from Kito et al. (Abstract, Problem to be Solved).

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10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. as applied to claim 1 above, and further in view of Inoue et al.

Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. suggests a device as recited above.

However, Hamilton et al. does not disclose a TE/TM converter.

Inoue et al. teaches a TE/TM converter (col. 16, lines 1-10).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. with the TE/TM converter of Inoue et al., since one would be motivated to achieve polarization-independent operation and reduce birefringence as implied from Inoue et al. (col. 15; lines 54-67).

11. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. (US Patent 5748811).

For purposes of being concise, Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., suggests a device as recited above.

However, Hamilton et al. does not a switch and second array or identical timing.

Amersfoort et al. teaches a switch and second array (Fig. 14, #174, 176, and 178).

Okugawa et al. shows identical timing (Abstract, Solution).

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It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. with the switch and second array of Amersfoort et al., since one would be motivated to have switching to create networks where signals are switched among fibers without the necessity of converting the signal to electrical form as implied from Amersfoort (col. 1, lines 25-30).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. with the identical timing of Okugawa et al., since one would be motivated to have identically separate timing to keep the signals from getting mixed as implied from Okugawa et al. (Abstract, Solution).

12. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. as applied to claim 11 above, and further in view of Ishida et al.

Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. suggests a device as recited above.

However, Hamilton et al. does not disclose a Mach-Zehnder switch with a thin film heater.

Ishida et al. teaches a Mach-Zehnder switch with a thin film heater (col. 8, lines 66-67, and col. 9, lines 1-5).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. with the Mach-Zehnder switch or Ishida et al., since one would be motivated to use it as a selector to determine which signals get through as implied from Ishida et al. (col. 8, lines 57-67).

13. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. as applied to claim 11 above, and further in view of Kito et al. (JP 09-258045).

Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. suggests a device as recited above.

However, Hamilton et al. does not disclose a multi-mode interference optical coupler.

Kito et al. teaches a multi-mode interference optical coupler (Abstract, Solution).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. with the coupler of Kito et al., since one would be motivated to use it for super-high speed optical transmissions in optical communication systems as implied from Kito et al. (Abstract, Problem to be Solved).

14. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. as applied to claim 11 above, and further in view of Inoue et al.

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Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. suggests a device as recited above.

However, Hamilton et al. does not disclose a TE/TM converter.

Inoue et al. teaches a TE/TM converter (col. 16, lines 1-10).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. with the TE/TM converter of Inoue et al., since one would be motivated to achieve polarization-independent operation and reduce birefringence as implied from Inoue et al. (col. 15, lines 54-67).

Response to Arguments

15. Applicant's arguments filed 9/22/03 have been fully considered but they are not persuasive.

In response to applicant's arguments, the recitation "an optical signal processing device which is a purely optical device that operates entirely in an optical region" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. This recitation would have patentable weight if it were to be included at the end of claims 1 and 11.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



gk



DAVID V. BRUCE
PRIMARY EXAMINER